

Title: Creosote and Soot Destroying Fire Log

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### TECHNICAL FIELD

This invention relates to a creosote and soot removing composition, and more particularly to a solid, non-paraffin bound, compressed particulate combustible fire log comprised of a cupric chloride and trisodium phosphate chemical composition for destroying creosote and soot deposits in chimney flues. These creosote and soot deposits are formed as the result of burning solid fuels such as coal and wood, and present a potential danger of chimney malfunction or fire if left untreated. This creosote and soot destroying fire-log is ignited and allowed to burn, thereby releasing the composition to treat the chimney flue.

### BACKGROUND OF THE INVENTION

Creosote and soot are natural by-products of burning solid fuels such as coal and wood, especially in common household wood-burning or pellet-burning stoves. Use of low flame conditions in stoves of this type, while slowing combustion to sustain heat output with lower fuel consumption, favors creosote and soot formation in stove pipes and chimneys.

Creosote is a tar-like material that can build up on the insides of stove pipes and chimneys to a point that effective operation of the flu can become impaired, or worse yet, that can ignite and cause a chimney fire endangering life and property. It is therefore highly desirable to provide ways to reduce the formation of creosote. One such effective way is by the use of a creosote removing material. Creosote removing materials are generally added to a stove fire during use.

The most effective soot removing materials are based upon chloride salts, such as sodium chloride and other metallic chlorides, such as zinc, tin and copper. When an additional metallic chloride is used in combination with sodium chloride, the presence of the additional metal chlorides increases the soot removing effect and promotes more effective soot removal. However, sodium chloride and the other metallic chlorides are quite corrosive to the ferrous materials commonly used in flue pipes of typical wood burning stoves. Accordingly, it is desirable to provide an effective metallic chloride-based composition which is effective for removing both creosote and soot, yet which will not cause the severe corrosive effect on metal surfaces generally associated with this type of soot removing material.

The market is replete with chemical or catalytic products for the cleaning of stove pipes and chimneys. Some of these contain sulfur whose purpose is to decompose soot and tars to make them more flammable with all attendant risks, such as a fire in the chimney, since the flue must be heated to a maximum to make the material operative; there also remains a risk of damage to the flue when using caustic soda or decomposition products thereof.

The scientific literature and patents disclose many other chemical or catalytic agents intended to inhibit the settling of deposits in furnaces and chimneys or even to disaggregate these deposits once formed. Unfortunately, these agents cannot be handled easily in many cases, particularly when present as a liquid or a powder. The liquid agents require injection nozzles and their use is not feasible with domestic heating devices; the powdered agents cannot be used easily since a powder in more or less precise dosage must be sprinkled onto a fire of variable intensity, whose measure and control cannot be carried out easily. Also, a large portion of the powder or decomposition products may be easily lost in the atmosphere which results in losses in the efficacy of the products and pollution hazards.

FR-A- 2 554 458 discloses a solid combustible agent for preventing or curing soot in heat

generating devices. The agent comprises, e.g., wood particles, a soot preventing or curing agent and a binder. The agent is used in an active conventional fire in low proportion, e.g., a few tens of grams of active material per each metric ton of fuel.

The use of wax as a binder for sawdust in artificial logs is known from U.S. Pat. No. 4,147,518, U.S. Pat. No. 3,297,419 and U.S. Pat. No. 3,637,355. Chemicals in minor proportions may be added to improve the combustion or produce colored flames, but the resulting logs do not appear to have any effect on soot or tars in chimney flues.

GB-A- 2 145 731 discloses cellulose briquettes incorporating combustion modifiers such as sulfur oxyacid derivatives or phosphorus oxyacid derivatives.

GB-A- 1 001 772 discloses a cleaning agent for heat transfer surfaces which comprises a mixture of potassium nitrate and a combustible material. This agent is introduced into a hot furnace.

U.S. Pat. No. 4,481,010 discloses a creosote and soot removing composition comprising a metallic chloride and trisodium phosphate, said composition being sprinkled onto a fire.

U.S. Pat. No. 2,777,761 discloses a composition comprising ammonium chloride, copper sulfate and wood flour which assists in the burning of soot and carbon deposits in combustion chambers, flues, etc.

WO-A-82 04065 discloses a process for removing soot from enclosed spaces comprising the introduction of steam saturated with specific chemicals.

U.S. Pat. No. 5,284,636 discloses the use of phosphorus oxide to stabilize the ash produced by the combustion of heavy metals containing fuel.

DE-A- 384 429 84 discloses a combustion improving composition comprising a number of chemicals including ammonium compounds which are said to clean heating devices and flues.

U.S. Pat. No. 5,882,365 discloses a soot disaggregating combustible agent bound within a

solid combustible form that reduces the disadvantages of free liquid or powdered agents that must be added to an existing fire. However, this disclosure is limited in application due to the necessary addition of a binder element to the solid, namely paraffin wax in a relative proportion of 10 to 70%.

The heat generated by paraffin-bound solids exceeds manufacturers' recommended use in household wood or pellet burning stoves, which itself threatens life and property, or at the very least, a violation of a stove manufacturer's warranty terms. Even when used in a traditional fire place, paraffin-bound solids are limited to one-at-a-time use to maintain safe temperatures.

Thus, there exists a need for a creosote and soot destroying agent utilizing the benefits derived from a solid combustible form that may be safely burned in a household wood or pellet burning stove.

#### SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide a compressed particulate combustible fire-log comprised of a chemical composition for destroying creosote and soot deposits in chimney flues. This fire-log is ignited and allowed to burn, thereby releasing the composition to treat the chimney flue.

Because most particulate combustible logs, including those which contain soot destroying agents, are bound by paraffin wax and thereby generate high operating temperatures, such products are prohibited for use in household wood and pellet-burning stoves. It is therefore a further object of this invention to provide a compressed particulate combustible fire-log for treating creosote and soot deposits in chimney flues that is safe for use in household wood or pellet-burning stoves.

The prior art teaches various means of applying liquid or powdered creosote and soot destroying chemical compositions to existing fires that have been largely inconvenient,

inefficient, potentially dangerous. Prior art teaching application of creosote and soot destroying chemical compositions by means of solid combustibles may not be added to existing fires and must instead be burned alone. Accordingly, it is a further object of this invention to provide a means for the treatment of creosote and soot in chimney flues by means of a solid combustible that may be used alone or added to an existing fire with equally effective results.

All patents and publications cited herein are hereby incorporated by reference.

### DETAILED DESCRIPTION OF THE INVENTION

Chloride salts, such as alkali metal salts including sodium chloride and potassium chloride and chlorides of zinc, tin and copper and the like are known to be effective soot removing materials. However, the chloride salts are also known to be extremely corrosive which make them undesirable for use in a wood burning stove in view of the metallic components used for stoves, dampers, and flue pipes. Addition of trisodium phosphate dodecylhydrate produces a product which is highly effective in creosote removal while maintaining the soot removing properties of the metallic chloride and substantially reduces the corrosive effects of the chloride salts on metal surfaces.

The most effective chemical combinations have been comprised of a cupric chloride and trisodium phosphate. However, the present invention provides an improved effectiveness for destroying creosote and soot in stove pipes and chimney flues of fireplaces and household wood and pellet-burning stoves has been achieved through a variation of existing chemical compositions. This chemical composition is admixed to 100% Douglas Fir sawdust and a very small proportion of vegetable oil for a homogeneous composition that is compressed to form a compressed particulate combustible fire-log having the burning properties of cord wood with the benefits derived from the effective treatment of creosote and soot.

## BEST MODE OF CARRYING OUT THE INVENTION

The invention is described here in a preferred embodiment. The preferred embodiment involves the use of a creosote and soot destroying chemical composition comprised of the following components, proportions given by weight per volume:

(a)	Soda Bicarbonate	400#	17.4%
(b)	Aracoal Anthrateg	400#	17.4%
(c)	200 Volclay Bentonith	200#	8.7%
(d)	Talc	50#	2.2%
(e)	Copper Oxychloride	200#	8.7%
(f)	#200 Olivine Sand	1000#	43.5%
(g)	Kerosene	2.5 gal. = 12#	0.5%
(h)	Cedar Sawdust	35#	1.5%

## INDUSTRIAL APPLICABILITY

The invention has application in the fields of creosote and soot removing compositions in a combustible particulate fire log. In particular the current invention discloses a compressed particulate combustible fire-log comprised of a cupric chloride and trisodium phosphate chemical composition for destroying creosote and soot deposits in chimney flues.

In compliance with the statute, the invention has been described in language more or less specific as to creosote and soot removing compositions in a combustible particulate fire log. It is to be understood, however, that the invention is not limited to the specific features shown, since the embodiment shown comprises preferred form of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims, appropriately interpreted in accordance with the doctrine of

equivalents.

## CLAIMS

What is claimed is:

1. A creosote and soot removing composition in a combustible particulate fire log comprised of:
  - a chemical composition comprised of cupric chloride and trisodium phosphate;
  - a vegetable oil binder; and
  - a 100% wood sawdust compressed to form a solid form.



## ABSTRACT OF THE INVENTION

A solid particulate combustible fire log for destroying creosote and soot deposits in chimney flues. The fire log is comprised of a cellulose particulate material, preferably sawdust, and a catalyst comprised of cupric chloride and trisodium phosphate. The fire log is ignited and allowed to burn, thereby releasing the catalyst to treat the chimney flue.